Amendments to the Claims:

This listing of claims will replace all prior listings of claims in the application.

Listing Of Claims:

Claims 1-35 (canceled).

Claim 36 (currently amended): An exposure apparatus for exposing a pattern onto an object, said exposure apparatus comprising:

an optical element provided in a vacuum atmosphere; and

a cooling apparatus for cooling the optical element using a radiation cooling,

wherein said cooling apparatus comprises:

a board arranged apart from the optical element, said board having a temperature that is smaller than a temperature of the optical element;

a Peltier element having a heat absorption surface and a heat radiation surface, and connected to the board through the heat absorption surface;

a radiation block connected to said Peltier element through the heat radiation surface ~~through said Peltier element~~, said radiation block having a channel to flow a coolant for cooling the heat radiation surface and being placed in a vacuum atmosphere; and

a controller for controlling temperature of said board by changing voltage applied to said Peltier element;

wherein said cooling apparatus cools said optical element by controlling the temperature of said board and maintains a temperature of ~~the coolant is substantially the same as the temperature of~~ the coolant to a predetermined temperature.

Claim 37 (previously presented): An exposure apparatus according to claim 36, further comprising a detector for detecting temperature of the optical element,

wherein a temperature of the heat absorption surface is controlled based on the temperature detected by the detector.

Claim 38 (previously presented): An exposure apparatus according to claim 36, wherein said optical element is a mirror.

Claim 39 (previously presented): An exposure apparatus according to claim 38, wherein said board faces a rear surface of the mirror.

Claim 40 (previously presented): An exposure apparatus according to claim 36, further comprising a radiation shield member to shield radiation heat transfer between the board and a member different from the optical member.

Claim 41 (previously presented): An exposure apparatus according to claim 36, wherein a difference between the temperature of the coolant and the temperature of the optical element is less than 5° C.

Claim 42 (previously presented): An exposure apparatus according to claim 36, wherein a difference between the temperature of the coolant and the temperature of the optical element is less than 1° C.

Claim 43 (previously presented): An exposure apparatus according to claim 36, wherein a difference between the temperature of the coolant and the temperature of the optical element is less than 0.2° C.

Claim 44 (previously presented): A device fabrication method comprising the steps of:

exposing an object to a pattern using an exposure apparatus according to claim 36; and

developing the exposed object.